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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/667,870 | 09/22/2003 | Francesco Coppola | TI-34641 | 1168 |
| 23494 | 7590 | 03/04/2005 | | EXAMINER |
| TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265 | | | CHANG, JOSEPH | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2817 | |

DATE MAILED: 03/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

N/A

| | | | |
|------------------------------|-----------------|----------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/667,870 | COPPOLA ET AL. | |
| | Examiner | Art Unit | |
| | Joseph Chang | 2817 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-12 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 22 September 2003 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|---|--|
| <ol style="list-style-type: none"> 1)<input checked="" type="checkbox"/> Notice of References Cited (PTO-892) 2)<input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3)<input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>11/13/03</u>. | <ol style="list-style-type: none"> 4)<input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____. 5)<input type="checkbox"/> Notice of Informal Patent Application (PTO-152) 6)<input type="checkbox"/> Other: _____. |
|---|--|

DETAILED ACTION

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "10" has been used to designate both Fig.1 and Fig. 3. "10" in Fig. 3 should be --20-- as described in the specification. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The disclosure is objected to because of the following informalities: "the lower bound of the frequency range (f_{\max})" should be --the lower bound of the frequency range (f_{\min})-- in line 27, Para. [0032].

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7, 9-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Su et al. (cited by the applicant).

Su et al. discloses a tuning circuit (Figures 2 and 5) comprising: a voltage controlled oscillator (Figure 5) for generating a first clock signal (fref) comprising: an inductive element; a variable capacitive element coupled to the inductive element; a bank of switched capacitors coupled to the inductive element and the variable capacitive element (see Figure 5); a frequency divider (250) for generating a second clock signal (output of 250) responsive to the first clock signal (fref) an a predetermined divisor (Col. 8, lines 29-52); frequency control circuitry (220 and 230) controlling the variable capacitive element responsive to a frequency difference (output of 220) between the first (fref) and second (output of 250) clock signals; and logic circuitry for (state machine, Col. 6, line 51): determining an initial control word to configure the bank using a search responsive to a desired frequency (Col. 6, lines 50-61); and determining whether the initial control word should either remain the same or change to an adjacent control word (see Figures 6A-6C, Col.6, Line62 - Col.7, Line39).

Regarding Claims 2-6, it is noted that since there is no structure recitation in the claims, Examiner has a reason to believe that the functional limitations can be performed by the prior art structure (Su et al). It is also noted that no means for providing the search having an accuracy recited in Claim 2, comparing the desired frequency to upper and lower bounds recited in Claims 3-4, and that no means for

determining the difference between frequencies by a predetermined threshold (Claims 5-6) the recitations in the claims are purely functional and method steps that does not affect the structure recited in the claims. Since the prior art is fully capable of handling the claimed recitations, Claims 2-6 are rejected.

Regarding Claim 7, Su et al. discloses a method (Figures 6A - 6C) of calibrating a voltage controlled oscillator (as discussed in the Claim 1 rejection) having an LC tank with an inductive element, a variable capacitive element coupled to the inductive element, and a bank of switched capacitors coupled to the inductive element and the variable capacitive element (Figures 2 and 5), comprising the steps of: determining an initial control word to configure the bank (Col.6, lines 35-61) using a search responsive to a desired frequency (Col.6, lines 46-49) enabling a set switched capacitors in the bank responsive to the initial control word (Col.6, lines 50-61); comparing an output frequency from the voltage controlled oscillator with the desired frequency (by 220); and determining whether the initial control word should either remain the same or change to an adjacent control word (see Figures 6A-6C, Col.6, Line62 - Col.7, Line39).

Regarding Claim 9, Su et al. discloses the step of determining whether the initial control word remains the same comprises the step of comparing the desired frequency to upper and lower bounds of a frequency range for the voltage controlled oscillator while configured according to the initial control word (Col. 7, lines 22-39).

Regarding Claim 10, Su et al. discloses the step of determining the initial control word comprises the step of using fast comparisons between an actual frequency and the desired frequency (by phase detector 220) and wherein the step of determining

whether the initial control word should remain the same comprises the step of using more precise comparisons between the actual frequency and the desired frequency (col.7, lines 50-Col.8, line 28).

Regarding Claim 11, Su et al. discloses the step of determining whether the initial control word remains the same comprises the step of determining whether if between the desired frequency and an actual frequency for the difference voltage controlled oscillator while configured according to the initial control word is within a predetermined threshold (Col.7, lines 5-21).

Regarding Claim 12, Su et al. discloses the step of determining whether the difference between the desired frequency and an actual frequency is within a predetermined threshold comprises the step of calculating an indication of the actual frequency by counting clock cycles from the voltage controlled oscillator in a frequency divider circuit (Col. 8, line 29 - Col. 9, line 40).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Su et al.

As discussed in the Claim 7 rejection, Su et al. discloses a method of calibrating a VCO except the accuracy that is greater than or equal to +/- 1 least significant bit of the initial control word.

As would have been recognized by one of ordinary skill in the art, such value of the accuracy would have been obvious for mere optimization of value.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Jansson discloses calibrating the center frequency of VCO using digitally controlling capacitors.

Mucke et al. discloses a fully integrating VCO having a LC circuit and digital capacitors

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Chang whose telephone number is 571 272-1759. The examiner can normally be reached on Mon-Fri 0700-1730.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on (571) 272-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Joseph Chang
Patent Examiner
Art Unit 2817